

ABSTRACT OF THE DISCLOSURE

Disclosed is a bi-directional wavelength-division multiplexing optical communication system including a first optical transmitter/receiver unit for transmitting a forward optical signal composed of a plurality of channels respectively allocated with wavelengths having a desired wavelength space while receiving a reverse optical signal composed of a plurality of channels respectively allocated with wavelengths each interleaved between associated ones of the wavelengths of the forward optical signal, a second optical transmitter/receiver unit for transmitting the reverse optical signal while receiving the forward optical signal, an optical fiber coupled between the first and second optical transmitter/receiver units, the optical fiber serving as a transmission medium for the forward and reverse optical signals, and an optical amplifier device arranged on the optical fiber and adapted to interleave the channels of the forward and reverse optical signals, bi-directionally received via the optical fiber, in accordance with the wavelengths of the channels, to amplify an interleaved optical signal generated in accordance with the interleaving operation, to split the amplified optical signal into the forward and reverse optical signals in accordance with wavelengths, and to bi-directionally transmit the split forward and reverse optical signals via the optical fiber.